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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,455	07/25/2003	Jung W. Lee	JWLE-01000US0	3415

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EXAMINER	
HARRIS, KATRINA B	

ART UNIT	PAPER NUMBER
3747	

DATE MAILED: 06/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/627,455	LEE, JUNG W.	
	Examiner	Art Unit	
	Katrina B. Harris	3747	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (6,415756) in view of Kobayashi(6,651,612). Lee discloses a spherical rotary engine valve (10) assembly for a combustion cylinder in an engine, comprising: a valve mounted for rotation and having a spherical shape with an opening formed within an outer surface of the valve, the opening having a shaped surface including a convex portion and a concave portion; a seal having a first and second rings for sealing an interface between said valve and the combustion chamber, a force exerted on a portion of said first ring causing a force between said second ring and the valve outer surface; except a contoured piston head formed on a piston operating within the combustion chamber, said contoured piston head having a first concave section generally conforming to a shape of the valve, and a second concave section having a deeper recess than said first concave section. Kobayashi discloses a contoured piston head having a first concave section generally conforming to a shape of the valve, and a second concave section having a deeper recess than said first concave section.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the piston of Kobayashi in the invention of Lee to increase efficiency of the system.

Regarding claim 2, comprising a valve housing positioned adjacent said valve on a side of the valve generally opposite from the cylinder, a gap being defined between said valve and said valve housing, said valve housing including a trench for preventing a flow of gas in a direction within said gap.

Regarding claim 3, a spherical surface over a majority of said rotary engine valve, said spherical surface capable of substantially sealing the opening to the combustion chamber against fluid flow into or out of the combustion chamber as the spherical surface is positioned over the combustion chamber during rotation of the rotary engine valve; and a shaped section having a surface with a different curvature than said spherical surface, the shaped section including a leading edge and a trailing edge, the leading edge capable of opening to the intake manifold and the combustion chamber before the trailing edge during rotation of the rotary engine valve, said shaped section capable of allowing fluid flow from the intake manifold into the combustion chamber when the leading edge of the shaped section rotates past the intake manifold, portions of the shaped section adjacent the leading edge having a concave shape for enhancing initial volumetric fluid flow from the intake manifold into the combustion chamber as the leading edge rotates past the intake manifold.

Regarding claim 4, the rotary engine valve further capable of allowing fluid flow from the combustion chamber to an exhaust manifold, the shaped section capable of

allowing fluid flow from the combustion chamber to the exhaust manifold when the leading edge of shaped section rotates past the combustion chamber, the concave shape of the portions of the shaped section adjacent the leading edge capable of enhancing initial volumetric fluid flow from the combustion chamber into the exhaust manifold as the leading edge rotates past the combustion chamber.

Regarding claim 5, the trailing edge of the shaped section compressing the fluid in the combustion chamber as the trailing edge rotates past the combustion chamber.

Regarding claim 6, the shaped section getting narrower from the leading edge to the trailing edge for promoting turbulent flow of the fluid entering the combustion chamber.

Regarding claim 7, comprising: a rotary engine valve rotating about a reference axis, the rotary engine valve capable of sealing an opening to a combustion chamber, and the rotary engine valve capable of allowing fluid flow from an intake manifold into the combustion chamber, the rotary engine valve including: a spherical surface over a majority of said rotary engine valve, said spherical surface capable of substantially sealing the opening to the combustion chamber against fluid flow into or out of the combustion chamber as the spherical surface is positioned over the combustion chamber during rotation of the rotary engine valve, and a shaped' section having a surface with a different curvature than said spherical surface, the shaped section including a leading edge and a trailing edge, the leading edge capable of opening to the intake manifold and the combustion chamber before the trailing edge during rotation of the rotary engine valve, portions of the shaped section adjacent the leading edge having

a concave shape for enhancing initial volumetric fluid flow from the intake manifold into the combustion chamber as the leading edge rotates past the intake manifold.

Regarding claim 8, the rotary engine valve further capable of allowing fluid flow from the combustion chamber to an exhaust manifold, the concave shape of the portions of the shaped section adjacent the leading edge capable of enhancing initial volumetric fluid flow from the combustion chamber into the exhaust manifold as the leading edge rotates past the combustion chamber.

Regarding claim 9, further comprising a valve housing generally surrounding the rotary engine valve, a gap being defined between the valve housing and the rotary engine valve, the valve housing including a trench for preventing a flow of fluid within the gap between the exhaust manifold and the combustion chamber.

Regarding claim 10, the trailing edge of the shaped section compressing the fluid in the combustion chamber as the trailing edge rotates past the combustion chamber.

Regarding claim 11, further comprising a piston head on a piston reciprocating within the combustion chamber, the piston head including a first concave area generally matching the curvature of the spherical section, and a second concave area having a greater concavity than the first concave area.

Regarding claim 12, a seal having a first and second rings for sealing an opening between said spherical portion of the rotary engine valve and the combustion chamber, a force exerted on a portion of said first ring causing a force between said second ring and the spherical portion of the rotary engine valve.

Regarding claim 13, an air runner within the intake manifold, the air runner capable of directing fluid to the portions of the shaped section adjacent the leading edge after the leading edge passes by the air runner.

Response to Arguments

Applicant's arguments with respect to claims 1 and 2 have been considered but are moot in view of the new ground(s) of rejection.

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katrina B. Harris whose telephone number is 571-272-4842. The examiner can normally be reached on 6:00 AM -2:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Yuen can be reached on 571-272-4856. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Katrina B. Harris
Examiner
Art Unit 3747

MAHMOUD GIMIE
PRIMARY EXAMINER

6/13/05